Regency® COMMUNICATIONS INC.

SERVICE MANUAL

REVERSE BURST CIRCUIT

MODEL MA-304

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SATELLITE BEACH, FLA. 32937

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SERVICE INSTRUCTIONS

REGENCY MA 304

REVERSE BURST CIRCUIT

A. GENERAL DESCRIPTION

The reverse burst circuit, MA 304, is used to eliminate the squelch tail heard in transceivers that use a vibrating resonant reed for decoding CTCSS tone frequencies. This option can be used with Regency transceivers equipped with CTCSS options MA-164, 165, 166 and 300.

A block diagram of the system is shown in Figure 1; parts layouts are given in Figures 2 and 3. A complete schematic diagram of the circuit is shown in Figure 4.

B. CIRCUIT DESCRIPTION (Refer to Figure 1 and the Schematic Diagram, Figure 4)

The function of the reverse burst circuit is to generate a phase reversal of the transmitted CTCSS tone, and to keep the transmitter on for a short period of time after the push-to-talk (PTT) switch is released. This out-of-phase signal is used to quickly stop the vibrating resonant reed in the receiving station's receiver before the transmitted signal stops, thus eliminating the squelch tail heard in the receiver. The circuit operates as follows:

The tone from the CTCSS option board is applied to input terminal U2, and it splits into two paths. One path uses a transistor amplifier Q2201 to give 180° phase reversal; the other path is through a RC network with some phase shift and reduction in amplitude. The gate output appearing at terminal U2 is either the in-phase or out-of-phase tone depending on which has been selected by the select gates. The in-phase tone will be present when the PTT button is on (terminal C5 becomes grounded and CR2204 conducts), the out-of-phase tone will be present when the PTT button is released (CR2201 conducts and CR2204 opens). The output tone appearing at U2 connects to the transceiver's modulator circuitry and appears as a low frequency tone on the transmitted signal.

The duration of the reverse phase transmitted signal (reverse burst) is determined by the holding circuit consisting of the time constant C2209 with associated resistors and transistors Q2202 and Q2203. When PTT switch is on, the transmitter relay gate CR2203 conducts and carries the relay current. When PTT button is released CR2203 is open and relay current flow is through transistor Q2202. This transistor conducts for approximately 400 milliseconds while capacitor C2209 is charging. After C2209 is charged, Q2202 and Q2203 stop conducting and the transmitter relay opens to cut off the transmitter.

C. INSTALLATION (Refer to Figure 5 for location of pins.)

Plug the jumper kit wires onto the option board pins by matching the pin symbols with the sleeves on the wired receptacles.

Mount the option board MA 304 as shown in Figure 5 with the two sheet metal screws supplied by inserting the screws from the solder side of the main PC board.

Remove the jumper connecting Pin 3 of the microphone plug, mounted on the chassis, and Pin C5 on the main chassis. Solder the new jumper provided in the kit to Pin 3. (The opposite end of this jumper C5 now connects to the Pin C5 on the MA 304 option.) Connect jumper leads from option board to Pins P1, P2, P5, C5, U2 and G on main PC board.

Connect the U2 input lead from MA 304 option board to the U2 pin on the CTCSS option board.

D. ADJUSTMENT PROCEDURES

No adjustments are required specifically for the MA 304 option. However, tone frequencies and levels must be set in accordance with adjustment procedures given in the service manual for CTCSS option Model MA-164,165,166 and 300.

E. SPECIFICATIONS

These specifications are only preliminary and more complete information will be provided at a later date.

Temperature Range	$-30^{\circ}C$ to $+60^{\circ}C$
Length of Reverse Burst	370 - 420 MSEC
Tone Voltage Input (Pin U2)	.09V Peak to Peak
Tone Voltage Output (Pin U2)	.02V Peak to Peak
Phase Shift (out-of-phase)	Approximate 230°

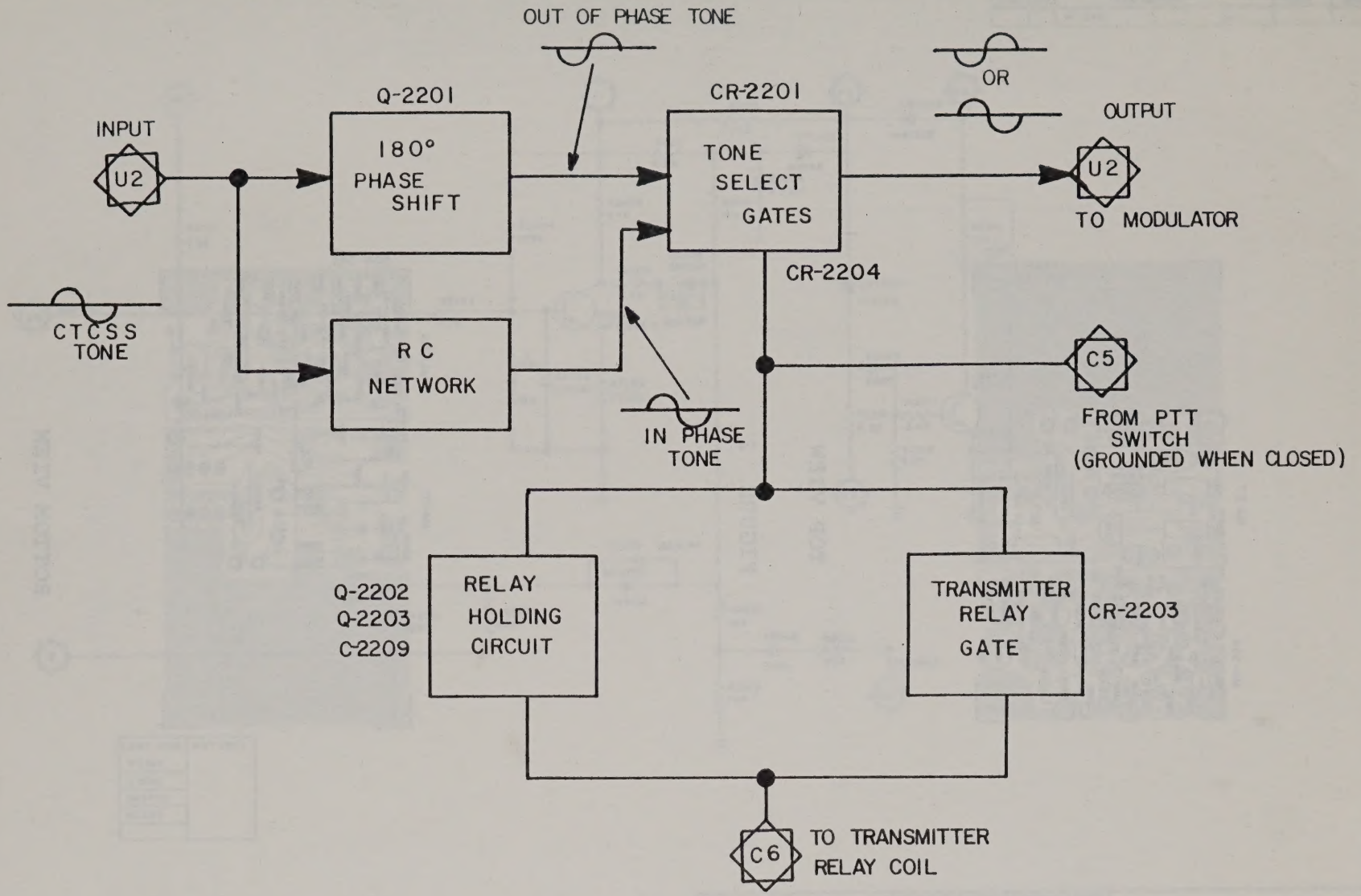
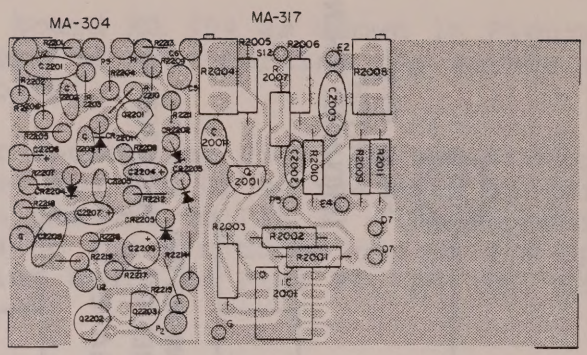
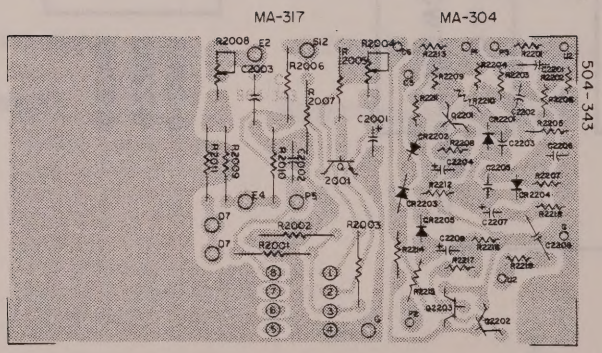


FIGURE 1
BLOCK DIAGRAM MA-304
REVERSE BURST CIRCUIT



TOP VIEW

FIGURE 2



BOTTOM VIEW

FIGURE 3

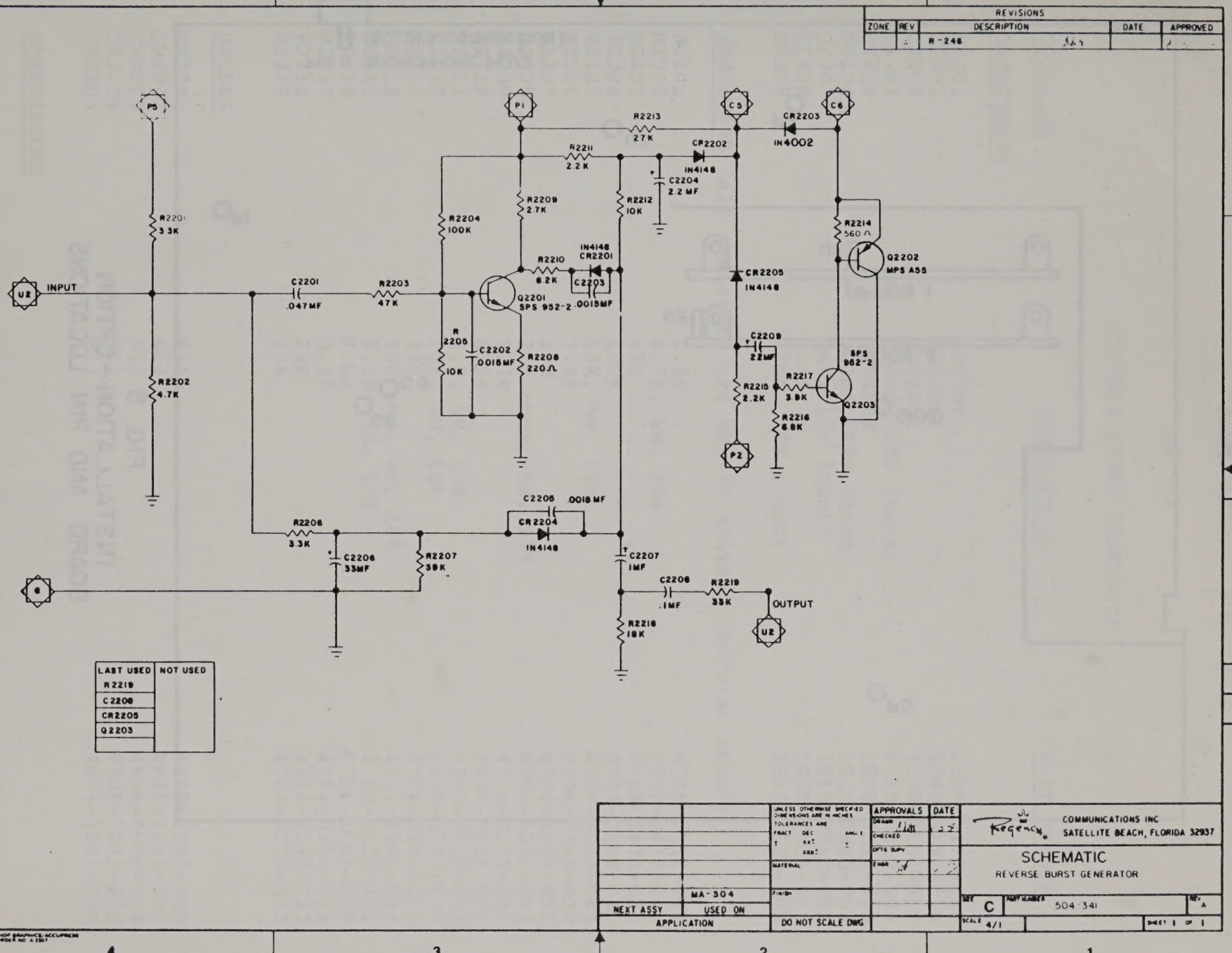

REVISIONS
ZONE | REV | DESCRIPTION | DATE | APPROVED
R-248
P3
P1
C5
C6
R2213
2.7K
CR2203
IN4002
R2211
2.2K
CR2202
IN4148
C2204
2.2 MF
R2201
3.3K
R2209
2.7K
R2212
10K
R2204
100K
R2214
560Ω
Q2202
MPS A55
IN4148
CR2201
R2210
8.2K
C2203
.0018MF
CR2205
IN4148
U2
INPUT
C2201
.047MF
R2203
47K
Q2201
SPS 952-2
C2209
22MF
SPS
962-2
R2205
10K
C2202
.0018MF
R2208
220Ω
R2217
3.9K
R2215
2.2K
Q2203
R2216
6.8K
P2
R2202
4.7K
C2205
.0018 MF
CR2204
IN4148
R2206
3.3K
C2206
33MF
R2207
39K
C2207
1MF
C2208
.1MF
R2219
33K
OUTPUT
U2
R2218
18K
LAST USED | NOT USED
R2219
C2208
CR2205
Q2203
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACT DEC ANG
APPROVALS | DATE
DRAWN
CHECKED
OPTG SUPV
ENGR
MATERIAL
FINISH
MA-304
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DWG
Regency COMMUNICATIONS INC
SATELLITE BEACH, FLORIDA 32937
SCHEMATIC
REVERSE BURST GENERATOR
SIZE C
504-341
REV A
SCALE 4/1
SHEET 1 OF 1

FIGURE 4

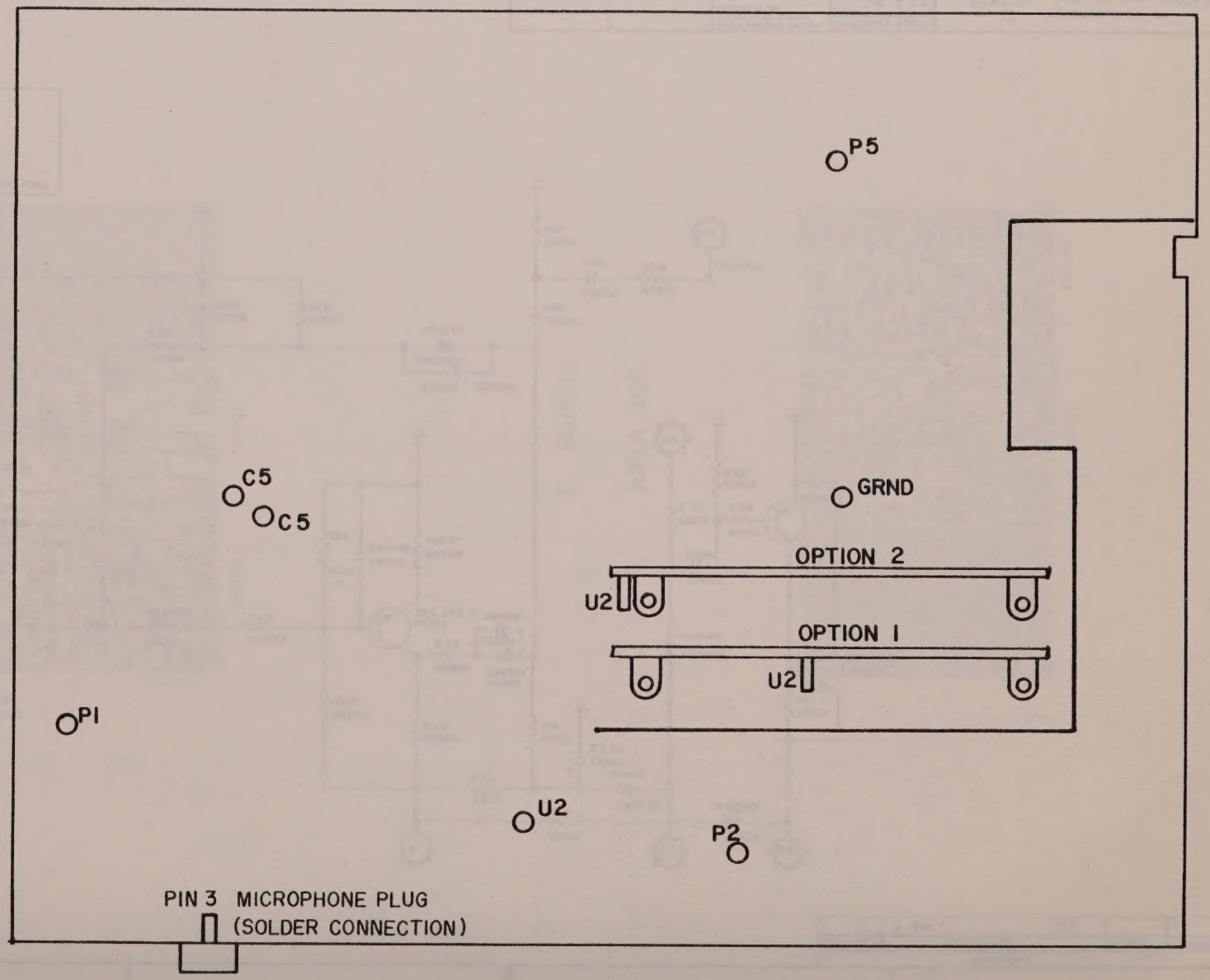


FIG. 5
INSTALLATION-OPTION
BOARD AND PIN LOCATIONS

PARTS LIST

MA 304

REVERSE BURST GENERATOR

LOCATION	DESCRIPTION	PART NUMBER
CAPACITORS		
C2201	.047mf	1508-0473-610
C2202	.0015mf	1508-0152-610
C2203	.0015mf	1508-0152-610
C2204	2.2mf, 25V (tant)	1515-0229-005
C2205	.0015mf	1508-0152-610
C2206	.33mf, 15V (tant)	1515-0338-003
C2207	1mf, 15V (tant)	1515-0010-003
C2208	.1mf	1502-0104-005
C2209	22mf, 16V (tant)	1515-0220-002
RESISTORS (all resistors are ¼W, 5% unless otherwise noted)		
R2201	3.3K	4704-0332-032
R2202	4.7K, ¼W, 10%	4700-0472-042
R2203	47K	4704-0473-032
R2204	100K	4704-0104-032
R2205	10K, ¼W, 10%	4700-0103-042
R2206	3.3K	4704-0332-032
R2207	39K	4704-0393-032
R2208	220 ohms, ¼W, 10%	4700-0221-042
R2209	2.7K	4704-0272-032
R2210	8.2K	4704-0822-032
R2211	2.2, ¼W, 10%	4700-0222-042
R2212	10K, ¼W, 10%	4700-0103-042
R2213	27K	4704-0273-032
R2214	560 ohm, ½W, 10%	4701-0561-044
R2215	2.2K, ¼W, 10%	4700-0222-042
R2216	6.8K	4704-0682-032
R2217	3.9K	4704-0393-032
R2218	18K	4704-0183-032
R2219	33K	4704-0333-032
DIODES		
CR2201	Sil	4805-1241-200
CR2202	Sil	4805-1241-200
CR2203	Sil	4806-0000-004
CR2204	Sil	4805-1241-200
CR2205	Sil	4805-1241-200
TRANSISTORS		
Q2201	NPN	4801-0000-016
Q2202	PNP	4801-0000-001
Q2203	NPN	4801-0000-016